

looking ahead

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The Nth Country Problem and Arms Control

NPA's Committee on Security through Arms Control released on January 24, 1960, a technical report and policy statement, The Nth Country Problem and Arms Control. Three competent physicists, William C. Davidon, Marvin Kalkstein, and Christoph Hobenemser, investigate the likelihood of a nuclear spread while the policy statement by the committee considers the implications of the spread of nuclear weapons and the methods which might prove effective in dealing with this spread.

The following article excerpts selected key parts of the committee statement. It is not, however, a representative summary of the views presented in the longer paper.

THE PAPER SHOWS that while many nations are capable of creating an atomic weapon without outside assistance, it is as easy to overestimate the rapidity of the spread of nuclear weapons as it is to underestimate it. The difficulties and delays faced in the French atomic weapons program demonstrate concretely that a nuclear weapons capability is not easily arrived at.

Dangers of Diffusion

This committee feels that the prospect of widely scattered nuclear weapons presents a very serious threat to world stability. This scattering was called the "third country problem" in the days before Britain had nuclear power; it was called the "fourth country problem" before France had the bomb within her reach; and it is now safer to call it the "Nth Country problem." It is a challenge which is not receiving the very serious attention it deserves at home or abroad. It is also an opportunity to find at least one common concern which might move the nuclear powers of both the East and of the West to achieve some limited agreements for joint action.

The Challenge of the Sixties

● "In short, in the world of the Sixties, we in the West shall form a small, wealthy élite in the vast, poverty-stricken society of mankind—a society shot through with revolutionary prospects and desires. Confronted with this fact, we have only two choices. We can follow the fatal road of other wealthy élites, like the pampered court of Cnossos or the French nobility at Versailles, play our games and close our hearts until the unfolding of a wider destiny engulfs us all.

"Or we can use our wealth to redeem the promise of our free society and extend its working to our fellow men who everywhere labor and look for change and growth with minds divided between penury and hope. The Sixties will compel the taking of this decision. On it, in great measure, our future in freedom depends."

From an article by Miss Barbara Ward, "The Challenge of the Sixties," which appeared in the New York Times Magazine, December 27, 1959. Miss Ward, a British analyst of world problems and past editor of The Economist recently reviewed the NPA study, East and West in India's Development, by Wilfred Malenbaum, for the New York Times Book Review. Miss Ward concluded her review: "Mr. Malenbaum's packed, factual and authoritative study is the best, rapid summary available of India's problems today, and no one interested in the great duel in Asia can afford to leave it unread."



Proliferation of nuclear weapons will inject incalculable factors into the equation of international politics. Some countries, under economic or other pressures, may eventually sell atomic weapons. Governments under fanatics or dictators may act rashly. The possibility of accidental or of unauthorized use of atomic weapons will increase. Irresponsible "mischief-making" by one small nation could catalyze a nuclear conflict between larger powers, or might cause pre-existing nonnuclear hostilities to escalate into nuclear hostilities.

The risk of accidental war by the mischievous action of a third party or by the possible mismanagement of tests, war exercises, strategic miscalculations, and the like is further enhanced by the rapid introduction of "quick reaction" systems. These tend to be inflexible, so that full-scale war may grow out of inadvertencies or deliberate mischief. It will become even more difficult to achieve and enforce arms control agreements, and much harder to inspire confidence in their effectiveness.

THE NTH COUNTRY problem derives urgency from the fact that we are approaching the point where it will no longer be possible for the present nuclear powers to control the spread of nuclear weapons. Once a nation has successfully completed an atomic weapons program, it will have nuclear stockpiles which can be stored without appreciable deterioration, which can survive changes of government, and which can be sold, exchanged, or given away.

The period, then, in which the major power blocks have a common opportunity to limit membership in the "atomic club" is, in the long view of history, a very brief one. We are now living in that period, and ten years of it have gone by.

The question of whether to invest or not to invest in nuclear armaments will be debated in many capitals during the years ahead. No aspirant can afford to ignore the grave difficulties and heavy expenses which confront a would-be atomic power, nor ignore the fact that a profuse capacity for destruction is not necessarily a source of security. It is certainly clear that atomic weapons projects are not, in the present state of the art, easy for a middle-sized nation to undertake. But standards of rational priorities or economic effort are not always observed, and from the days of the pyramids of Egypt, human needs have been sacrificed to concepts of glory. We cannot predict with assurance what nations will have, and what nations will not have, independent atomic capabilities in the years ahead.

France and Britain

This statement is not a discussion of arrangements to share weapons or delivery systems with allied nations as a matter of mutual defense. Such arrangements are made within the context of existing arms competition and tensions, and this committee does not recommend unilateral disarmament measures. Nor do we criticize British and

French decisions to achieve independent nuclear weapons capability. We note, however, that many competent military experts, including outstanding experts in Britain and France, have criticized the British and French nuclear weapons development from the standpoint of the effective allocation of defense effort.

It has been said that the disproportionate emphasis on a strategic nuclear weapon has resulted in a neglect of more important limited war capabilities and that possession of a small stockpile of nuclear weapons of a fairly primitive sort, without advanced means of delivery, is of doubtful value. Although France has an advanced aircraft industry, it has no heavy bomber which could effectively penetrate the borders of the Soviet Union, and neither France nor Britain have the long-range missile capabilities required for modern nuclear weapons systems. Security vis-à-vis the great powers cannot be achieved merely by developing a nuclear warhead without the support of the most modern aircraft and missiles. And the use of nuclear warheads against targets whose defenses are more primitive raises the specter of the "catalytic war," which starts between small nations but eventually draws in great-power protectors.

However, the much criticized French decision to arm atomically was not lightly made. The French were persuaded primarily by the argument that no alliance or commitment would be strong enough to compel any nation to risk nuclear destruction to aid another. They would explain their position approximately as follows: (1) nuclear power does not deter aggression unless the potential aggressor believes that the nuclear retaliation, causing greater destruction than he is willing to bear, will actually be used to answer an attack; (2) it is not credible that a country will enter a nuclear war, exposing its own cities to obliteration, solely in defense of another nation; (3) therefore, the only nuclear power that deters an attack on France is one that rests entirely in French hands. Some French writers go on to make three further points: (4) the only nuclear deterrent that will protect other European countries is one that lies completely in the hands of each such country; (5) therefore, each European country should have an independent atomic capability; and (6) since the interests of France are closely enmeshed in those of the rest of Europe, France will be safer if every major European country has its own atomic weapons capability.

However, the strong impression persists that the true French motivation, conscious or unconscious, is the belief that possession of nuclear weapons will heighten national prestige and promote French eligibility for American nuclear assistance.

Peaceful Uses and Military Development

The distribution of reactors to utilize atomic energy for peaceful purposes has considerable bearing on the distribution of military nuclear capacity, because of the possibility of using these reactors to produce weapons-grade fissionable material for weapons. Intergovernmental contracts for as-

sistance in building power reactors are going forward rapidly. They are constructive and commendable. At the moment, they do not involve the danger of military production, but such programs may well, over the years, expedite a spread of nuclear weapons. The possibility can be minimized by control arrangements over the type of reactor and its operational processes, and over all the materials that enter and leave it.

CONTROLS are technically possible because the very practices which contribute to the manufacture of the best weapons-grade material are those which tend to make the production of heat and power least efficient. Perversion of the purposes of the reactor can be prevented by requiring that the design of the reactor and the procedures for handling fuel conform to the necessities of efficient energy production, and by forbidding those which result in the purest material for weapons. If fuel rods remain in the reactor beyond a certain period, the plutonium 239 that is collecting in the fuel elements becomes "poisoned" by plutonium 240, which makes the resulting material more difficult to use for weapons purposes. Thus economic operations favor longer fuel cycles, and the use of shorter cycles would indicate a military purpose.

The Board of Governors of the International Atomic Energy Agency (IAEA) has drafted a set of control regulations subject to approval in 1960 by the Agency's General Conference, on which all members are represented. EURATOM (European Atomic Energy Community) is also trying to develop such a safeguards system, and the United States, United Kingdom, and Canada place safeguards on their exports under bilateral contracts.

The maintenance of strict control arrangements in bilateral contracts may become more difficult, however, as the bargaining power of recipient nations increases. Fuel consumers, led by India, demonstrated a strong resistance to controls in the discussions which preceded the adoption of the Statute of the IAEA. In their view, the imposition of controls was an insulting symbol of the desire of the great powers to perpetuate a monopolistic position. These pressures may become difficult to resist in future bilateral contracts.

The IAEA presents a genuine opportunity to mitigate the danger of the diversion of nuclear power reactors to military purposes. It can administer controls strictly, without injury to national pride. Its rules provide for the application of a very effective set of controls. At the present time, the IAEA, a large and expensive piece of administrative machinery, is standing idle. The nuclear powers are bypassing it by the use of bilateral contracts. Yet, the IAEA could insulate the major powers from imprudent demands on the part of recipient countries. An agreement, expressed or implied, among the major powers to use the IAEA in place of bilateral agreements would be a major step toward eliminating the possibility of the diversion of power systems to weapons development.

Findings and Conclusions

In conclusion the committee finds:

- 1) That if present national policies continue, independent nuclear military power will be spread widely among many countries within the next 30 years.
- 2) That the diffusion of independent nuclear weapons among many countries will, over the years, upset international stability and increase the danger of war.
- 3) That the spread of nuclear know-how and equipment through international assistance in peaceful economic uses of nuclear power, although useful and praiseworthy, might tend eventually to contribute to the diffusion of military nuclear power.
- 4) That nuclear military assistance programs providing for the gift and loan of warheads do not directly create independent nuclear power, but are factors which will tend over the years to contribute to the growth of such independent nuclear power.

The committee concludes:

- 1) That the dangers of the wide diffusion of nuclear weapons within the next 30 years are real. Such diffusion may very well vitiate the stability which could conceivably otherwise arise in an era of balanced nuclear forces. These dangers must be considered by both the United States and the Soviet Union in all their negotiations on arms control. Neither side wishes to take substantial risks, but both sides must consider the heavy risks involved in continued inaction.
- 2) That the nuclear powers could curtail the dangers of perversion of economic aid programs for peaceful uses of nuclear power if they would make greater use of international agencies which impose stringent controls. Both the East and the West could operate through the IAEA without loss of national advantage. This would require no further treaties. If one side embarked upon such a policy and the other did not follow, there would be no loss greater than a slight loss of operating efficiency and of influence on the commercial aspects of reactor operation.
- 3) That direct control of the spread of independent military nuclear power is possible only in terms of larger disarmament arrangements. The promulgation and enforcement of an effective international accord to cease nuclear tests will tend to prevent the development of nuclear weapons by new countries. More comprehensive agreements—particularly those looking toward controls on production—will provide a more potent inspection system, which could enable control authority to detect evasions with certainty and accuracy.

(The Nth Country Problem and Arms Control, A Statement by the NPA Special Project Committee on Security through Arms Control and A Technical Report by William C. Davidson, Marvin I. Kalkstein, and Christoph Hohenemser, National Planning Association, Washington, D. C.: 1960, 64 pp., \$1.00.)

Economic Expansion in Western Europe

The rising tide of economic activity in Western Europe with its increased industrial outputs and expanding trade is examined in the latest U.N. *Economic Bulletin for Europe*. The deterioration of the United States balance of payments, the fall in the West German official reserves, the rehabilitation of the French Franc and the growing strength of the Sterling are also discussed.

Outlining the principal trends of what is, in the main, an encouraging period, the *Bulletin* reports large increases in the outputs of the steel, metal-using, and chemical industries, and lesser but still important increases in textile and food processing. The principal factors generating this increased economic activity have been a continuing rise in private consumption, particularly of durable goods, and the large amount of residential and other construction.

The *Bulletin* notes that imports into Western European countries generally increased most where the domestic expansion has been strongest, due to the fairly high levels of activity from which the expansion resumed and the need to replenish stocks. As a result, the volume of imports has increased in most countries relatively more than the volume of industrial production. Indeed, the proportionate increase of the former was roughly twice as great as that of the latter in the majority of the countries from mid-1958 to mid-1959.

On the export side, states the *Bulletin*, the volume sent to overseas countries including North America did not decline in 1958, but its rate of growth diminished. By the second quarter of 1959, both exports to overseas countries and intra-European trade had increased by almost 15 percent over the same quarter of 1958, whereas the rate of increase of imports from overseas was only half as great.

An important change has occurred in the international liquidity position of the United States during the first three quarters of 1959. The net U. S. balance of payments deficit in the first quarter of 1959 amounted to \$860 million—or \$3.7 billion at a seasonally adjusted annual rate—and by the second quarter rose to an annual rate of \$4 billion. This deficit is directly attributable to large scale assistance extended to Western European and other countries to promote economic recovery and growth and to relieve the imbalances in international trade. Because the United States is the largest creditor on long-term capital account and holds extensive gold reserves, the *Bulletin* points out that there is "little reason for dismay." However "it is plain that a deficit of this magnitude could not be sustained indefinitely."

(*Economic Bulletin for Europe*, Economic Commission for Europe, United Nations, New York: 1959, 68 pp., 50¢ per copy.)

—The People of NPA—

William
Waymack



William Waymack, a former Atomic Energy Commissioner and Pulitzer Award winning editorial writer, is a member of NPA's International Committee.

He received his A.B. from Morningside College, Sioux City, Iowa, in 1911, and was awarded an honorary Litt.D. by his alma mater in 1939. In addition, he has received honorary degrees from Drake University, Parsons College, Grinnell College, and Iowa State College in recognition of his editorial achievements.

Upon graduation, Mr. Waymack began his career in journalism as a reporter for the *Sioux City Journal*, and four years later, he became city editor and chief editorial writer for the *Journal*. From 1918 until his retirement in 1946, Mr. Waymack was on the editorial staff of the *Des Moines Register and Tribune*. During this time, he served in various editorial capacities including editor of the editorial section, managing editor, editor-in-chief, and vice president of the Register and Tribune Company.

His interests and activities extend far beyond his vocational fields of journalism and newspaper management. He has served as chairman of the Economic Policy Committee and the Western Policy Committee, and during World War II was special advisor to the State Department. He also was deputy chairman of the board and public director of the Federal Reserve Bank in Chicago. In addition, he has served as a member of the American Council for NATO, the National Committee of the American Civil Liberties Union, the Commission on International Economic Reconstruction, and the Commission to study the Organization of Peace. He was a member of the Inter-Allied Commission which supervised the postwar free election in Greece in 1946. In 1959, he became an Honorary Officer of the Order of the British Empire, by award of H. M. Government.

He was also on the board of trustees of the Carnegie Endowment for International Peace, 1941-1959, and is a director of the Twentieth Century Fund.

Free Trade Area in South America

by John Lindeman

Mr. Lindeman is the author of The Philippine American Life Insurance Company, and coauthor with Wayne C. Taylor of The Creole Petroleum Corporation in Venezuela. Both studies are part of the NPA case study series on U. S. Business Performance Abroad. He is presently with International Economic Consultants, Inc.

THE CHANCES APPEAR GOOD that concrete steps will soon be taken to put into effect a free trade zone among the seven southernmost countries of South America: Argentina, Brazil, Bolivia, Chile, Paraguay, Peru, and Uruguay. Representatives of the seven countries met in Montevideo in September 1959, to consider a draft treaty, and scheduled a second Montevideo meeting for February 1960, at which it is expected that the seven foreign ministers will sign the treaty on behalf of their governments. However, the treaty will not come into force until it has been ratified by at least three countries.

A Mexican observer at the September meeting said that his government would be interested in participating in the free trade area and noted with approval that the draft treaty permitted accession by any Latin American country. Later unconfirmed reports are that Mexican interest has heightened since then.

The draft treaty provides that substantially all customs and other trade restrictions among the participating countries shall be gradually removed over a twelve-year period at the rate of at least 8 percent a year. Specific tariff reductions would be negotiated annually to meet this goal. Special concessions can be granted to countries at a low level of economic development in order to facilitate their participation, and there are saving clauses which permit emergency re-imposition of restrictions. As is the case with the European Economic Community, agriculture is recognized as a "special case."

TRADE AMONG THE PARTICIPATING countries has heretofore been relatively small as compared with the total trade of the area. This is because the South American economies have been largely oriented toward the production of primary commodities for export to the more industrialized parts of the world in exchange for manufactured goods. However, in recent years industrialization in the area has proceeded rapidly, and still more industrialization is wanted. A principal purpose of the free trade area is to enlarge the market so as to make it more economical to expand existing industries and to establish new ones. Thus, the expected benefits are with respect to future patterns of trade, and not present ones.

If the arrangements work out as planned, there will undoubtedly be a stimulus to local production of goods which have traditionally been imported from the United States and Europe. However, Latin American supporters of the

free trade area scheme point out that substitution of local production for imports is already taking place on a national basis, presumably with less efficiency than would be possible in an enlarged market area. Furthermore, they say that the need in Latin America for manufactured goods is so great that any substitution of local production for imports will be offset by increased imports of other goods.

On a smaller scale, a customs union is being formed by the five Central American countries. Already three countries—El Salvador, Guatemala, and Nicaragua—have ratified the basic treaty, and it is in force with respect to them. Subsidiary agreements, largely procedural, have been reached, and ratifications are expected soon.

International Scientific Management Conference

The twelfth International Congress of Scientific Management will take place in Sydney and Melbourne, Australia from February 22 through March 4, 1960. The two main themes of the conference will be "Management's Methods in the Next Decade" and "Management in a Developing Country."

An address will be given by Henry Ford II on "The Next Ten Years in Management," at the opening in Sydney on February 22.

Elmo Roper Receives Award

The Julian L. Woodward Memorial Award was presented to Elmo Roper, NPA Board and Business Committee Member, by the American Association for Public Opinion Research at its 1959 annual conference. The award, established in 1955 in memory of Julian L. Woodward, past AAPOR President, was presented to Mr. Roper "For a distinguished career in the practice and furtherance of the highest principles of public opinion research; his advancement of popular respect for our endeavor; his pioneering of the Fortune Survey; his untiring devotion to the cause of good citizenship and world order. A champion of civil liberties, equally vigilant in the determination of majority opinion and the protection of minority rights. A servant of the servants of mankind."

Economics and the Policy Maker

THE USE OF ECONOMICS by policy makers in the conduct of public and private affairs was the subject of the fourth series of Brookings Lectures for professional specialists and public officials held during the winter of 1958-59. The recent publication of these Lectures, *Economics and the Policy Maker*, presents the discussions of the eight participating economists who examine the contribution of economic analysis to business planning, economic stabilization, the problem of creeping inflation, taxation policy, monetary policy, collective bargaining, monopoly and competition, and economic growth.

Economics and Business Planning

Dr. Sidney Alexander of MIT in his discussion of the contribution that economics can make to the conduct of a business enterprise cites the traditional approaches to economics in business: microeconomics as an aid in short-run forecasting of the business cycle; macroeconomics in long-run planning and profit-maximizing; and descriptive economics, which gives practical content to the analyst and can be useful in relating the firm to its environment. He states, however, that for the successful application of economics to business, a great deal of judgment is required. "Economics can help to form the judgments, but the judgments, to be sound, must also take into account the context of facts from which economic theory habitually abstracts." He concludes that economics can be valuable in business only to the extent that it comes to grips with the facts of the situation, making allowances in particular for these considerations that are left out of the theoretical formulations.

Economic Stabilization

Dr. Gerhard Colm, Chief Economist of the National Planning Association, in his discussion on economic stabilization broadly interprets stabilization policy as "the promotion of balanced economic growth and the encouragement of a fair degree of stability, in both employment and prices."

He then examines a national stabilization policy within the framework of the three-stage procedure spelled out in the Employment Act of 1946. This Act specifically requests the President to state in his Economic Report:

- 1) "The economic goal—'levels of employment, production, and purchasing power needed to carry out the policy declared,' in the preamble of the act;
- 2) "Current and foreseeable trends in the levels of employment, production, and purchasing power under existing policies;
- 3) "A review of the effects of existing policy and recommendations of policies needed to accomplish the objectives of the act."

Dr. Colm then discusses what is required of economics if it is to contribute at each of the three above stages toward the formulation of an economic stabilization policy.

First, he states, it is essential to have a goal or policy, for without a goal, the policy maker has nothing to guide him. Furthermore, he would very likely be tempted to use the past rather than the future for his aim. Dr. Colm adds, however, that the setting of a goal is not just an expression of what an economist thinks is desirable growth. It is an estimate of a satisfactory level of production and employment. He contends that we must also determine whether there are other considerations of national policy that require a modification of the goal or objective.

In estimating the course of economic activity, Dr. Colm states that since absolute prediction is highly uncertain in the present situation, "it would be best to develop alternative estimates for a faster or slower rate of growth and analyze the factors on which realization of the one or the other alternative depends."

Because all economic data is open to a variety of interpretation and analysis and conflicting views, an appraisal of policy measures is at best at complex task asserts Dr. Colm. However, "the fact that the task is difficult is no justification for theoretical economists to escape into the 'pure' realm of mere inapplicable mathematical symbols or for action economists to escape into the realm of mere 'factual' statistical descriptions."

In his concluding remarks Dr. Colm calls attention to the gulf between the proponents of abstract economic theory on one side and the users of stabilization tools on the other. The tools and concepts of stabilization policy "did not originate in the course of what we call imminent 'academic' development of science. They originated on the 'firing line' of economics," notes Dr. Colm. He cautions, however, that "No scientific progress is possible without the thinking that can best be done in the contemplative atmosphere of the ivory tower. But the work in the ivory tower can be fruitful only if it is in two-way communication with the decision makers or with those who aid the decision maker."

The Problem of Creeping Inflation

Urging the economist to devote more time to the great issues of public policy, Neil H. Jacoby, former member of the Council of Economic Advisors asserts that creeping inflation is the result of general systematic faults in economic structure and policy and not the result of misbehavior by certain groups. Monetary and fiscal measures are not sufficiently flexible to offset cyclical changes in private demand and to hold aggregate demand around full employment, he contends, and there is insufficient flexibility in prices and movements of resources because of inadequate

competition and government interference with competitive markets. He then proposes reforms in five fields of economic policy: antimonopoly, agriculture, international trade, stockpiling, and federal taxation.

Other participants of the 1958-59 Lecture series were Louis Shere, Robert V. Roosa, Sumner H. Slichter, Mark S. Massel, and Everett E. Hagen.

(*Economics and the Policy Maker*, Brookings Lectures 1958-1959, The Brookings Institution, Washington, D. C.: 1959, 224 pp., \$2.95.)

Statistical Survey of Africa

Initial plans have been drawn up for a statistical survey of Africa which should yield considerable information on economic and social conditions in that continent over the next five years, reports the December issue of the *United Nations Review*. The first conference of African statisticians, which met in Addis Ababa last fall, was attended by thirty-nine representatives from member states and associate members of the Economic Commission for Africa.

Envisaged as a five-year task involving the cooperation of all African countries and of the United Nations statisticians as well as aid from the expanded program of technical assistance, the survey is an effort to promote statistical development to meet the requirements of economic and social planning. Most aspects of the Commission's work depend largely on the availability of comprehensive and reliable information, it was pointed out at the statistician's conference, and the greater part of the burden of the program of the statistical survey would fall on the governments of the African countries.

The survey will include basic statistics relating to population, the labor force, agriculture and industry, transport and communications, external trade, government and private financing, as well as health, education, and housing.

Each country and territory represented at the conference agreed to examine the proposed survey in the light of its own needs and capacities, and to report back to the Commission and to a further conference as to what it would be able to do in a target period of five years to give effect to the different categories of the survey. They will also indicate, at this time what external help, in the form of technical assistance, will be needed to speed up action.

It was also agreed, reports the *Review*, to exchange technical information concerning statistical methods applied to African conditions, to establish expert working groups on selected subjects to perfect techniques, and to develop measures to increase statistical training, particularly for middle-level personnel.

(*United Nations Review*, United Nations Office of Public Information, Columbia University Press, New York: December 1959, 96 pp., 50¢ per copy.)

Vocational Training in the USSR

Vocational training, established in 1920 in the USSR, has developed with the technological progress and demands of the country reports the latest issue of the *International Labour Review*. In a report by H. Zelenko, Chairman of the State Vocational and Technical Training Committee of the USSR Council of Ministers, the organization of vocational training in the USSR and the fundamental principles on which it is based, is described.

Among vocational training institutions, reports Mr. Zelenko, "the system of manpower reserve schools has the most important place." This system includes institutions of various types which differ according to the level of skill to be acquired by the students, the industry for which they are to be trained, and the level of the general education, as well as their age and other characteristics.

In many industries the manual workers are divided into three skill groups: low, medium, and high. Two types of institutions—industrial and mining schools—train workers in the lower group. The industrial, mining, railway, and building colleges are institutions open to the worker of medium skill.

Recent technical progress in the Soviet Union has dictated changes in vocational training. The rise in demand for persons with training in the medium and higher grades has resulted in a greater number of workers being trained in industrial colleges rather than industrial schools.

Also, in connection with the wide expansion of secondary education, Mr. Zelenko reports that a new kind of vocational school was introduced in 1954. Anyone who has finished secondary school (a ten-year general school course) who desires to go into productive employment may attend this technical institute which turns out highly skilled workers in trades requiring an advanced level of education or junior technicians, after courses lasting one or two years.

The educational system also includes twelve-year vocational and technical colleges which give a broad polytechnical training with both general and specialized secondary education points out Mr. Zelenko. The curriculum is designed so that graduates are prepared for a wide range of occupations, and in addition they are able to transfer from this institution to one of more specialized training if necessary.

In December of 1958, Mr. Zelenko reports that the Supreme Soviet of the USSR adopted an act instituting various reforms in the vocational and technical training programs. These include:

- 1) All institutions, of the various existing types, for the training of manual workers are to be transformed within the next seven years into a comprehensive system of vocational and technical colleges, which are classified as urban (courses lasting one to three years) and agricultural (one to two years).

Looking Ahead

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2) The vocational and technical colleges will specialize in particular branches of the economy and prepare skilled workers for specific trades and occupations in manufacturing, industry, construction, communications, public utilities, agricultural mechanics, rural electrification, commerce, and cultural and social activities.

3) Measures are to be taken to improve the staffing of all vocational and technical colleges, and supply them with the appropriate training workshops and laboratories. And, to ensure that the necessary practical instruction and training will be given, the colleges are to be closely linked with progressive undertakings that have new equipment and apply most advanced techniques and methods of organization.

In addition, changes in the curricula will include training under production conditions and the learning of new techniques. On the theoretical side, a new course entitled "Automation and Mechanisation of Production" and a

course on the "organisation and economics of production" will be given.

("Vocational and Technical Training in the U. S. S. R.," H. Zelenko, *International Labour Review*, International Labour Office, Geneva: December 1959, 108 pp., 60¢ per copy.)

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